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DISEASES CAUSED BY NEMATODES

BROWN RING DISEASE OF THE SWEET POTATO

W. H. Martin

The disease of sweet potatoes caused by Tylenchus dipsaci was described by Dr. Steiner (Pl. Reptr., Vol. XIV, page 109, July, 1930). The disease has appeared again this spring in New Jersey and has been made the subject of study by Dr. H. Kreis of the United States Department of Agriculture whose paper will probably appear during the year. The following notes on the occurrence of this disease in New Jersey may be helpful to pathologists in other states.

In the spring of 1930, sweet potatoes showing the brown ring condition were bedded but, while they remained sound for some time, they did not produce sprouts. During the summer and again at the time of harvest, a number of fields were examined but no signs of the disease were observed. This spring, (1931) however, further complaints were received and diseased potatoes were found in four storage houses in south Jersey. Potatoes from other growers stored in hampers in these same houses, and very often adjoining the diseased potatoes, did not show the disease.

One grower was interviewed who had the brown ring condition in his sweet potatoes in 1929 and again in 1930. He gave the following report: "Sprouts from one plant bed were used for setting out four fields and that in both years the disease appeared in only one. This field had not been planted in sweet potatoes for 10 to 15 years. Potatoes from low areas, particularly along a culvert, showed the most serious infection. When the potatoes were harvested, part were stored in old and the remainder in new baskets; this spring the disease was found to be equally severe in both the old and new baskets. A neighbor purchased ten hampers of potatoes directly from this field in the fall of 1929

and stored them in his own cellar with his seed. In the spring of 1930, at bedding time, his own seed was clean while the seed he purchased was severely affected."

Two other growers were interviewed who had some of this disease present in their crop and both reported that the fields in which the diseased potatoes were grown had not been planted in sweet potatoes for from 10 to 30 years. Several owners of storage houses report also that the trouble does not appear until early in March and that it is usually most prevalent in sweet potatoes nearest the steam pipes.

An examination of approximately 100 potatoes showed that infection was usually most severe in the vicinity of a cut or bruise. In a number of cases the tip of the potato showed no discoloration, while the remainder showed the deep brown ring in the cortical region. Large numbers of the nematodes may be found in the brown ring. In the tissue showing a slight yellowish discoloration just under the brown ring, nematodes may also be found, but in the healthy tissue just under this none have been observed. In the advanced stages of the disease, when the tissue shows a marbled condition and particularly later when the entire interior is a rich brown color, nematodes may be found in abundance throughout the potato. These potatoes are apparently free from fungi and bacteria.

In the early stages it is difficult to distinguish between a healthy and diseased potato from external appearance. When the brown ring is well developed, however, the skin is somewhat discolored and the epidermis slightly sunken. A finger nail puncture reveals the texture of the diseased potato to be spongy as compared with the crispness of a healthy potato.

Our observations to date would indicate that the disease is not widespread in New Jersey nor has it been particularly serious where it has been found. It is apparent, however, that there is a possibility of its becoming a very serious disease of the sweet potato.

TYLENCHUS DIPSACI, THE BULB OR STEM NEMA PARASITIZING STRAWBERRY PLANTS IN NORTH CAROLINA

G. Steiner

Tylenchus dipsaci, a nemic pest commonly found in the Pacific Northwest on Fragaria chiloensis and sporadically also on cultivated strawberry hybrids, was recently discovered for the first time in several cultivated varieties (Klondike, etc.) in North Carolina. The strawberry plants, submitted by Dr. Darrow, consisted of one case of six lots from Willard, North Carolina, two of which had a slight infestation of Tylenchus dipsaci. The plants exhibited none of the symptoms usually connected with this disease but had fasciated stems and fruits. In the second instance, the plants came from Mt. Olive, North Carolina and had a "somewhat abnormal appearance". Here too the infestation was slight and the specimens of the parasite were rather dwarfed, although in all other characters typical. Other nemic associates of more or less definite parasitic nature, like Cephalobus elongatus, Aphelenchus parietinus, and Tylenchus robustus were more or less numerous in these strawberry plants.

RHABDITIS LAMBDIENSIS MAUPAS ASSOCIATED WITH A DISEASE OF MUSHROOMS

G. Steiner

Prof. L. Hasemen of the College of Agriculture of the University of Missouri submitted nemas from badly diseased mushroom beds in a cellar in Leeds, Missouri. The nema involved is Rhabditis lambdiensis, a form of wide geographical distribution, usually considered saprophytic. According to Prof. Hasemen's observations, the disease started from an original center and spread rapidly through the mushroom beds over the whole cellar. First a little pit containing the nemas develops on the cap of a mushroom; this pit grows deeper and larger and finally leads to complete decay. However, it is probable that the Rhabditis present is only a secondary disease agent, a carrier which moves over the moist surface of the mushrooms during sprinkling time. From the contents of the pharynx and other parts of the alimentary tract, bacteria seem to be its food and not mycelium or its cell contents. It is therefore conceivable that Rhabditis lambdiensis carries decay-producing bacteria (perhaps Bacterium tulaasi) from mushroom to mushroom and acts as a secondary, although a most important, disease agent.

TOBACCO DOWNY MILDEW

NORTH CAROLINA

S. G. Lehman

The first case of downy mildew of tobacco in North Carolina was seen May 1. The earliest date at which the disease was noted by any of the growers interviewed was April 27. During the first week in May, the disease was found in the following counties: Robeson, Greene, Craven, Nash, Harnett, Sampson, and Johnston. Up to May 8 the disease, while rather widely scattered in the several counties named, had infected only a relatively small number of beds.

Observations made on a plant bed inspection trip, May 13-16, in company with Dr. J. G. Gaines and Dr. R. J. Haskell, indicate that downy mildew was at that time present in approximately half the beds in Johnston, Wayne, and Wilson Counties. The disease is now known to occur in Greene, Robeson, Craven, Pitt, Wilson, Nash, Johnston, Edgecombe, Sampson, Bladen, Columbus, Wake, Harnett, Moore, Wayne, and Franklin Counties. This distribution is shown on the accompanying map, Figure 4. No mildew was found in Halifax, Warren, and Vance Counties. These three counties lie along the Virginia-North Carolina line north of Edgecombe, Nash, and Franklin Counties.

The earliest infections seem to have taken place during the week of April 19-25 near or within a large triangular area whose points are marked

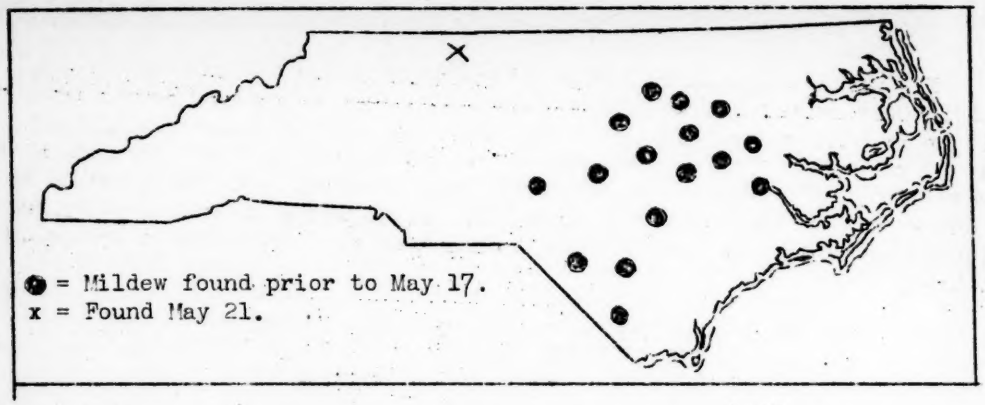

Figure 4. Counties in North Carolina in which downy mildew of tobacco has been found.

by the cities of Lumberton, Rocky Mount, and New Bern. Over this entire area numerous later infections occurred, apparently during the week of May 3-9 or a few days later.

The disease has spread rapidly in the beds in which it first appeared. However, very few, if any, plants have been killed. The buds continue to grow and new leaves are put out which do not become so severely diseased as might be expected from the severity of the earlier attack on the same bed.

PIEDMONT NORTH CAROLINA

E. Y. Floyd

During the week beginning May 18, the writer was engaged in a disease survey of tobacco plant beds of the Piedmont counties of North Carolina. Because of the known presence of downy mildew of tobacco in many counties of the Coastal Plain and because of the interest which it had aroused, careful watch was kept for this disease. No cases of downy mildew were found, however, until May 21, when recent infections were found in two beds in Stokes County, within three miles of the Virginia line (see Figure 4).

FLORIDA

L. O. Gratz

Downy mildew of tobacco was found in three seed beds in Gadsden County, May 8 and 9. These beds were several miles apart. One had been inspected on March 30 at which time no mildew could be found. From the general appearance of the diseased plants, it seems probable that the mildew had not been present in these beds more than a week. As the tobacco fields had all been set before the appearance of the disease in the plant beds, no commercial loss resulted from the infection.

No further reports on downy mildew in this section reached us until May 19. On that date, traces of this trouble were found in several shades but it is apparently serious in one shade only. I believe that in this instance about 80 per cent of the plants show some spotting on a large portion of the leaves. This is a 13-acre shade, about half of which has been planted to 94 and the other half to the Round Tip type. The shade where the injury is most severe at the present time is very uniform and most of the plants in it are about three feet high.

DOWNY MILDEW IN GEORGIA TOBACCO FIELDS

J. G. Gaines

Since the last issue of the Reporter, downy mildew has appeared in many tobacco fields scattered over eleven counties in the Georgia belt, and has also been found in plant beds in nineteen counties. Symptoms resulting from field infections were first seen in Berrien County the last week in April. Since that time the disease has been observed in forty-eight of sixty-one fields examined in ten additional counties. Excepting in rare instances, the damage thus far has been very slight, lesions being mostly confined to the lower unmarketable leaves and to low grade sand lugs. However, in a few fields, symptoms have appeared on leaves and cutters, and as many as thirty or more lesions have been counted on a few of the most severely affected leaves. In the majority of affected fields, from one to three small lesions may be seen on from one to five of the lower leaves. On late settings, symptoms are present only on the lower unmarketable leaves, and the slight losses sustained thus far are primarily confined to a few early settings.

In one three-acre field a moderate outbreak has resulted in a loss estimated to be 5 per cent. Several leaves are affected on 100 per cent of the plants. This field had been set early from a plant bed that showed no trace of mildew at the time of transplanting. In one instance, diseased plants set in a six-acre field from a severely affected bed the first week in April, have apparently completely recovered and show no signs or symptoms of mildew. Another field set from a similar bed at the same time shows only a trace of infection and the plants appear to be in healthy and normal condition.

Diseased plants left in the plant bed have also markedly recovered, but numerous reinfections of less intensity have recently become evident in most beds examined. Reinfection seems to be more prevalent on plants in these old beds than on plants set in the open. In many fields, missing hills were reset with mildew recovered plants, and in several instances the entire crop was set with diseased plants. At present these fields appear to have as good prospects for making a crop as other fields set with clean plants.

LOUISIANA

C. W. Edgerton

By May 4th, tobacco mildew had practically disappeared from St. James Parish where it was observed during the last of March and the first half of April (Pl. Dis. Reptr., Vol. 15, No. 4, page 32).

VEGETABLE DISEASES

LATE BLIGHT OF POTATOES IN THE LOWER RIO GRANDE VALLEY OF TEXAS

by

Walter J. Bach, Pathologist,
Texas Substation No. 15, Weslaco, Texas.

Late blight of potatoes, Phytophthora infestans (Mont.) deB., appeared in epidemic form in the Lower Rio Grande Valley about February 25, 1931 and has continued to be serious during the entire month of March. The presence of this disease has been reported from this section on tomatoes during the 1928 and the 1929 seasons but the extent of its occurrence in the Valley has been limited in the past. This season the disease occurred in practically every field in the Valley varying in damage from 25 to 100 per cent. The first outbreak appeared in a field planted from home-grown seed but it was observed almost simultaneously in other fields regardless of the source of the seed. Dealers report that approximately 85 per cent of the seed sold this year was certified. The yield in some of the best fields is being cut about half a portion of which may have been due to excessive moisture early in the planting season. A number of fields will not be dug due to late blight.

The weather conditions have been favorable this season for the development of late blight. An excess of moisture combined with cool, cloudy weather appears to have provided conditions favorable for its development. During the month of January there was a rainfall of approximately six inches, which was about 4.5 inches above normal. The temperature ran consistently low with a maximum ranging from 61° F. to 77° F. The month of February continued cool, and although there was less than an inch of rain, there was an excess of moisture in the soil and the majority of the days were cloudy and fog and heavy dews were common.

Bordeaux and copper-lime dust were used early in the outbreak of the disease but in most cases the methods of application were improvised. Aeroplane dusting of copper-lime dust has given the most satisfactory control so far. About 30 pounds of material per acre is used at each application and the applications are repeated at ten day intervals.

(Note): Since this report was written, several fields have been observed in which very good control was secured by the use of Bordeaux mixture 4:4:50. Early in the outbreak of the disease, frost nipped the vines so badly it was impossible to get the results from the use of this material. Copper-lime dust is apparently giving satisfactory results but control can be secured with less expense by the use of Bordeaux. (W. J. Bach, letter of April 24).

OTHER POTATO DISEASES IN TEXAS

Early blight, Alternaria solani, has become rather severe on potatoes since April 17. Fortunately the application of Bordeaux and copper-lime dust for the control of late blight will also reduce the extent of this disease to a minimum.

Potato scab, Actinomyces scabies, occurs on some of the first potatoes being dug but it is too early to tell the extent of the damage that may be expected from this disease this season. Sclerotium rolfsii is also appearing on potatoes to a limited extent. Some Rhizoctonia was noted early in the season on vines grown from uncertified seed.

(W. J. Bach, April 24)

POTATO DISEASES IN LOUISIANA

E. C. Tims contributes the following interesting report:

"A considerable number of potato fields were examined during a potato tour over several of the principal potato-growing parishes in the southwestern part of the state during the latter part of April. The potatoes were somewhat later than usual and were remarkably free from leaf diseases.

"Mosaic. The amount of rugose mosaic observed in fields of certified seed was negligible, only a trace being found in three fields during the trip. This would seem to indicate that this form of mosaic is of slight importance in the potato sections of the state as long as the best certified seed are used.

Mild mosaic was observed in most of the fields but seldom ran over 1 to 2 per cent.

"Blackleg (Bacillus phytophthorus). An occasional plant showing typical blackleg symptoms was found in many of the fields and infection ran up to 2 to 3 per cent in two plantings. This was a heavier infection than has been noted in the last several years.

"Rhizoctonia (Rhizoctonia solani). There was more Rhizoctonia this year than usual, although no infection as high as 2 per cent was noted. The Corticium stage of the fungus was found abundant on a number of plants near Donaldsonville.

"Early blight (Alternaria solani). During the last week of April, there was practically no early blight in any of the fields inspected. Only one field was found with any infection and only a few diseased leaves were found there. But when a number of fields were visited in Terrebonne Parish on May 5 and 6, heavy early blight infection was found. As high as 50 to 60 per cent of the plants in some sections were infected. It is hard to estimate the amount of damage caused by the disease because infection did not become general until a week or ten days before harvesting began."

OTHER REPORTS ON VEGETABLE DISEASES

TOMATO

Tomato diseases in the Rio Grande Valley in Texas: The first tomatoes are just being picked in the Valley. The vines are showing severe mosaic in some cases. Late blight, Phytophthora infestans, has also occurred to some extent on tomatoes, as well as Septoria blight, S. lycopersici. (W.J.Bach)

Besides late blight (Phytophthora infestans) on tomatoes, buckeye rot (Phytophthora terrestris), soil rot (Rhizoctonia solani), and bacterial spot (Bacterium vesicatorium) were the most important diseases observed in my recent visit to Harlingen, Texas. I found one specimen of the fruit spot caused by the bacterial canker organism (Aplanobacter michiganense). This disease was found in the Jacksonville area last year, but I do not believe it was reported from the Lower Valley. (G. B. Ramsey, May 15)

Damping-off (Pythium sp.) in Wisconsin. Specimens examined from Milwaukee truck garden. Plants attacked after being transplanted into cold frames. (R. E. Vaughan, April 22).

PEPPER

Pepper diseases in Texas: Peppers have been found dying recently from Phymatotrichum root rot, P. omnivorum, and Fusarium wilt. Mosaic has also been observed to be severe on plants carried through the winter. (W. J. Bach, April 24)

EGGPLANT

Blight (Phomopsis vexans) in Virginia: This fungus damped off approximately 35 per cent of the plants in the seed bed on one farm near Norfolk. Many of the remaining plants bear stem cankers. (Harold T. Cook, April 29)

CUCURBITS

Diseases in Texas: Squash, cantaloupes, and cucumbers have been severely attacked recently by downy mildew, Pseudoperonospora cubensis and by powdery mildew, Erysiphe cichoracearum. Bordeaux has been applied in some cases. (W. J. Bach, April 24)

PEAS

Pod spot (Mycosphaerella pinodes) in Georgia: A rather large proportion of the garden peas on the market in Athens have been spotted. (J. H. Miller, April 28)

FRUIT DISEASES

APPLE SCAB (VENTURIA INAEQUALIS)

Virginia: So far this has been an ideal season in Virginia for apple scab. There has been a lot of rain and the weather has been very cool. Ascospores were first discharged at Blacksburg on April 24. Mr. A. B. Groves reported the first discharge at Winchester on April 22. Scab infections were observed on apple foliage at Blacksburg on May 14. (S. A. Wingard, May 16)

Wisconsin: On April 10 a collection of crab leaves showed 30 per cent of asci with olivaceous spores. A slight discharge of spores was observed on agar plates. Leaf buds of Duchess and other early varieties in early green tip stage for spraying.

On April 23 a collection of leaves showed 60 to 85 per cent of asci with olivaceous spores. Fair discharge of spores onto agar plates. Wealthy variety showed early closed cluster stage for spraying. (R. E. Vaughan, April 24)

REPORTS OF APPLE RUST (GYMNOSPORANGIUM JUNIPERI-VIRGINIANAE)

Virginia: Mr. Groves reports spores exuding from cedar rust galls on April 22 at Winchester. (S. A. Wingard, May 16)

Wisconsin: On April 18, spore horns were found protruded about one-fourth inch near Madison. (R. E. Vaughan, April 24).

DISEASES OF CEREALS AND FORAGE CROPS

MILDEW ON WHEAT AND BARLEY IN VIRGINIA

Mildew (Erysiphe graminis) is playing havoc with wheat and barley in some sections of the State this season. (S. A. Wingard, May 16)

SOME REPORTS ON ALFALFA DISEASES

Wilt (Sclerotinia trifoliorum) in Virginia: Specimens of alfalfa affected with Sclerotinia trifoliorum were received from Newport News with the statement that the plants were going down very rapidly. Turnips preceded the alfalfa and were said to have been affected with the same disease. (Harold T. Cook, April 11)

Rust (Uromyces medicaginis) in the lower Rio Grande Valley of Texas. Burr clover and alfalfa show an abundance of rust. (W. J. Bach, April 24).

MARKET PATHOLOGY

NEW YORK MARKET PATHOLOGY NOTES

Cyril O. Bratley

STRAWBERRIES: As the strawberry season in the North Florida sections has been nearing its end, the berries from there have been arriving in New York in a poorer condition. During the past month, many express car shipments examined showed between 3 and 5 per cent Rhizopus Rot (Rhizopus nigricans) and an occasional berry affected with Gray Mold Rot (Botrytis cinerea). The berries from Louisiana, while showing less of the Rhizopus Rot, have lately averaged about 3 per cent affected with Gray Mold Rot.

CALIFORNIA CHERRIES: Brown Rot (Sclerotinia fructicola) was found to affect 25 per cent of the cherries in two cars from California. The average percentage loss from this decay for the past month has been about 3 per cent.

Rhizopus Rot (Rhizopus nigricans) was found affecting between 2 and 3 per cent of the cherries arriving during the month.

GRAPEFRUIT FROM FLORIDA: Blue Mold Rot (Penicillium spp.) was found in 6 per cent of the fruit in 12 shipments examined recently. This percentage is considerably higher than for the fruit received earlier in the season.

CELERY FROM FLORIDA: Late Blight (Septoria apii) was found to be severe in two shipments. The lesions occurred on the leaf blades and on many of the outer stalks of the bunches.

Watery Soft Rot (Sclerotinia sclerotiorum) was present to a limited extent in all of the shipments. In two shipments, 20 per cent of the bunches were affected by the disease.

Brown Stem (non parasitic) was found very commonly on stock arriving from Florida. Usually only two or three outer stems of the plant were affected. As usual, this discoloration was found on the stems of older plants. Many of those affected were so mature that the seed stalks were beginning to push up several inches above the crowns. Black Heart (non-parasitic) was found affecting 5 per cent of the plants in three shipments. In most cases the discoloration was slight affecting only one or two of the leaf blades in the heart. Black Heart and Brown Stem were often found affecting the same plant.